DOCUMENT RESUME

ED 028 150 SP 002 473

By-Weber, Wilford A.

Relationships Between Teacher Behavior and Pupil Creativity in the Elementary School.

Pub Date 68

Note-16p.; Paper presented at the annual meeting of the American Educational Research Association, Chicago, February 1968

EDRS Price MF-$0.25 HC-$0.90

Descriptors-*Creativity, Elementary School Students, Interaction Process Analysis, *Teacher Behavior

A four-year study was conducted to test the hypothesis that indirect teacher behaviors foster pupil creativity more than do direct teacher behaviors. Multivariate composite scores derived from interaction analysis data were used to classify 180 elementary school students (who had the same teacher for grades 1 through 3, and a different teacher in grade 4) as having experienced one of four teaching behavior combinations: indirect or direct all four years; indirect for three years and direct in the fourth year; and direct with indirect in the fourth year. Student responses to a creative thinking test composed within the framework of two forms of creative expression, verbal and figurative, were compared with their teacher behavior experience. Results suggest that verbal creativity is fostered more under the influence of indirect teacher behaviors, and that figural creative potentialities are encouraged more under the influence of consistent patterns of teaching behaviors. It would seem, then, that consistently indirect teaching behavior would encourage the growth of both verbal and figural creativ e expression. (A four-item bibliography is included.) (SM)

ED028150

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

RELATIONSHIPS BETWEEN TEACHER BEHAVIOR AND PUPIL CREATIVITY IN THE ELEMENTARY SCHOOL

Wilford A. Weber
Syracuse University

This study stemmed from the view that the fostering of the creative potential of pupils is a valued educational goal. Although recent educational publications have been replete with articles telling teachers of their obligation to foster pupil creativity, these recommendations have been mainly prescriptions, unsupported by research. The present study, therefore, attempted to clarify the teacher behavior-pupil creativity issue by investigating the relationships between specified patterns of teacher behavior and various dimensions of pupil creativity.

A conceptual model--suggested by the theoretical speculation of Rogers (1954) and the research of Flanders (1960)--led to the major assumption underlying this study: indirect teacher behaviors foster pupil creativity more than do direct teacher behaviors. This assumption served as the basis for the formulation and testing of hypotheses involving the teacher behaviors (indirect or direct) which elementary school pupils had experienced during a four year period--

Paper presented at the annual meeting of the American Educational Research Association, Chicago, February, 1968.

SP002473

the independent variable--and the creative productivity of these pupils--the dependent variable.

The general procedure was one in which the Flanders System of Interaction Analysis (Amidon and Flanders, 1963) was used to collect observational data about teacher-pupil classroom behaviors during the third grade and fourth grade experiences of 180 pupils in six schools in a suburban school district. Each pupil had been with the same teacher for his first three years of school--first, second, and third grade--and with a different teacher in fourth grade. Throughout this four year experience, pupils were grouped heterogeneously and were exposed to similar curricular programs, academic materials and facilities, and teaching specialists. The vast majority of the pupils were middle-class children of average or above average intelligence.

Multivariate composite scores were derived from these Interaction Analysis data and--on the basis of these scores--those teaching behaviors which the pupils had experienced during grades one through three and during grade four were designated as indirect or direct. Accordingly, pupils were classified as having experienced, during their first four years of school, one of four teaching behavior conditions:

TABLE I

TEACHING BEHAVIOR CONDITIONS

Group	Number	Three Year Experience	Fourth Year Experience
Aa	45	Indirect	Indirect
Ab	45	Indirect	Direct
Ba	45	Direct	Indirect
Bb	45	Direct	Direct

Analysis of intelligence measures taken from the pupils during their third grade experience indicated that these four groups did not differ significantly in intelligence.

The Torrance Tests of Creative Thinking, Verbal and Figural Tests, Form B (Torrance, 1966) were administered to the pupils during the seventh month of their fourth year experience. Scoring of pupil responses yielded seven measures of creativity:

1. Verbal fluency.
2. Verbal flexibility.
3. Verbal originality.
4. Figural fluency.
5. Figural flexibility.
6. Figural originality.
7. Figural elaboration.

The scores of pupils in the four teaching behavior conditions were compared using 2 x 2 factorial analyses of

variance. The results of these analyses are presented in Tables II through VIII on pages 5 through 11.

As seen in Tables II, III, and IV, main effects due to the three year experience were significant in all three of the verbal measures:

1. Verbal fluency: $F = 10.58$, $p < .01$.
2. Verbal flexibility: $F = 14.41$, $p < .01$.
3. Verbal originality: $F = 12.07$, $p < .01$.

Effects due to the fourth year experience did not, in any case, reach significance at the five percent level and only in the verbal fluency measure was the interaction effect significant ($F = 7.10$, $p < .01$).

This indicates, then, that in all of the verbal creativity measures, pupils who had experienced indirect teaching during their first three years of school (Groups Aa and Ab) achieved significantly higher scores than did pupils who had experienced direct teaching during their first three years of school (Groups Ba and Bb).

Table II also indicates that in the verbal fluency measure, an analysis of variance for simple effects which was calculated because of the significant interaction effect revealed that those pupils who had experienced four years of direct teaching (Group Bb, mean score of 46.86) achieved

TABLE II

ANALYSIS OF VARIANCE OF VERBAL FLUENCY CREATIVITY SCORES OF PUPILS IN FOUR TEACHING BEHAVIOR CONDITIONS

Analysis of Variance

Source of Variation	SS	df	MS	F
Three Year Experience	2792.67	1	2792.67	10.58**
Fourth Year Experience	772.94	1	772.94	2.92
Interaction	1875.34	1	1875.34	7.10**
Error	46436.25	176	263.84	
Total	51877.20	179		

Simple Effects

Source of Variation	SS	df	MS	F
Fourth Year Experience for Indirect Three Year Experience	120.18	1	120.18	----
Fourth Year Experience for Direct Three Year Experience	2528.10	1	5228.10	9.58**
Error	46436.25	176	263.84	

*$F_{.95}(1,176) = 3.90$.

**$F_{.99}(1,176) = 6.78$.

Means

		Fourth Year Experience					
		Indirect		Direct		Total	
		N	Mean	N	Mean	N	Mean
Three Year Experience	Indirect	45	52.40	45	50.09	90	51.24
	Direct	45	38.06	45	46.86	90	42.46
	Total	90	45.23	90	48.48	180	46.86

TABLE III

ANALYSIS OF VARIANCE OF VERBAL FLEXIBILITY CREATIVITY SCORES OF PUPILS IN FOUR TEACHING BEHAVIOR CONDITIONS

Analysis of Variance

Source of Variation	SS	df	MS	F
Three Year Experience	911.25	1	911.25	14.41**
Fourth Year Experience	3.47	1	3.47	----
Interaction	174.05	1	174.05	2.75
Error	11124.18	176	63.20	
Total	12212.95	179		

*$F_{.95}(1,176) = 3.90$.
**$F_{.99}(1,176) = 6.78$.

Means

		Fourth Year Experience					
		Indirect		Direct		Total	
		N	Mean	N	Mean	N	Mean
Three Year Experience	Indirect	45	28.22	45	25.98	90	27.10
	Direct	45	21.75	45	23.44	90	22.59
	Total	90	24.98	90	24.71	180	24.84

TABLE IV

ANALYSIS OF VARIANCE OF VERBAL ORIGINALITY CREATIVITY SCORES OF PUPILS IN FOUR TEACHING BEHAVIOR CONDITIONS

Analysis of Variance

Source of Variation	SS	df	MS	F
Three Year Experience	906.76	1	906.76	12.07**
Fourth Year Experience	180.00	1	180.00	2.39
Interaction	49.08	1	49.08	----
Error	13213.74	176	75.07	
Total	14349.58	179		

*$F_{.95}(1,176) = 3.90$.

**$F_{.99}(1,176) = 6.78$.

Means

		Fourth Year Experience					
		Indirect		Direct		Total	
		N	Mean	N	Mean	N	Mean
Three Year Experience	Indirect	45	22.18	45	19.13	90	20.66
	Direct	45	16.64	45	15.68	90	16.16
	Total	90	19.41	90	17.40	180	18.41

TABLE V

ANALYSIS OF VARIANCE OF FIGURAL FLUENCY CREATIVITY SCORES OF PUPILS IN FOUR TEACHING BEHAVIOR CONDITIONS

Analysis of Variance

Source of Variation	SS	df	MS	F
Three Year Experience	38.27	1	38.27	1.14
Fourth Year Experience	14.45	1	14.45	----
Interaction	101.25	1	101.25	3.03
Error	5887.78	176	33.45	
Total	6041.75	179		

*$F_{.95}(1,176) = 3.90$.

**$F_{.99}(1,176) = 6.78$.

Means

		Fourth Year Experience					
		Indirect		Direct		Total	
		N	Mean	N	Mean	N	Mean
Three Year Experience	Indirect	45	18.56	45	16.09	90	17.32
	Direct	45	17.57	45	18.51	90	18.04
	Total	90	18.07	90	17.30	180	17.68

TABLE VI

ANALYSIS OF VARIANCE OF FIGURAL FLEXIBILITY CREATIVITY SCORES OF PUPILS IN FOUR TEACHING BEHAVIOR CONDITIONS

Analysis of Variance

Source of Variation	SS	df	MS	F
Three Year Experience	8.02	1	8.02	----
Fourth Year Experience	47.02	1	47.02	2.77
Interaction	59.69	1	59.69	3.52
Error	2980.27	176	16.93	
Total	3095.00	179		

*$F_{.95}(1,176) = 3.90$.
**$F_{.99}(1,176) = 6.78$.

Means

		Fourth Year Experience					
		Indirect		Direct		Total	
		N	Mean	N	Mean	N	Mean
Three Year Experience	Indirect	45	14.42	45	12.16	90	13.29
	Direct	45	13.60	45	13.82	90	13.71
	Total	90	14.01	90	12.99	180	13.50

TABLE VII

ANALYSIS OF VARIANCE OF FIGURAL ORIGINALITY CREATIVITY SCORES OF PUPILS IN FOUR TEACHING BEHAVIOR CONDITIONS

Analysis of Variance

Source of Variation	SS	df	MS	F
Three Year Experience	23.48	1	23.48	----
Fourth Year Experience	6.06	1	6.06	----
Interaction	36.43	1	36.43	1.44
Error	4434.23	176	25.19	
Total	4500.20	179		

*$F_{.95}(1,176) = 3.90$.

**$F_{.99}(1,176) = 6.78$.

Means

		Fourth Year Experience					
		Indirect		Direct		Total	
		N	Mean	N	Mean	N	Mean
Three Year Experience	Indirect	45	11.60	45	11.07	90	11.34
	Direct	45	11.42	45	12.68	90	12.06
	Total	90	11.51	90	11.87	180	11.70

TABLE VIII

ANALYSIS OF VARIANCE OF FIGURAL ELABORATION CREATIVITY SCORES OF PUPILS IN FOUR TEACHING BEHAVIOR CONDITIONS

Analysis of Variance

Source of Variation	SS	df	MS	F
Three Year Experience	1258.75	1	1258.75	----
Fourth Year Experience	6171.75	1	6171.75	3.99*
Interaction	5313.81	1	5313.81	3.43
Error	272019.69	176	1545.56	
Total	284764.00	179		

*$F_{.95}(1,176) = 3.90$.

**$F_{.99}(1,176) = 6.78$.

Means

		Fourth Year Experience					
		Indirect		Direct		Total	
		N	Mean	N	Mean	N	Mean
Three Year Experience	Indirect	45	112.27	45	113.11	90	112.69
	Direct	45	106.68	45	129.26	90	117.97
	Total	90	109.48	90	121.18	180	115.33

significantly higher ($F = 9.58$, $p < .01$) scores than did pupils who had experienced three years of direct teaching and then indirect teaching during their fourth year (Group Ba, mean score of 38.06). It also revealed that differences in the fourth grade experience did not have a significant effect on the scores achieved by pupils who had experienced indirect teaching during their first three years of school (Groups Aa and Ab, mean scores of 52.40 and 50.09).

Results of the analyses of pupil scores on the four figural measures (fluency, flexibility, originality, and elaboration) presented in Tables V through VIII revealed only one main effect which was significant at the five percent level; in the figural elaboration measure, the main effect due to the fourth year experience was significant ($F = 3.99$, $p < .05$). This indicated that, irrespective of their three year experience, pupils who had experienced direct teaching in the fourth grade (Groups Ab and Bb, means of 113.11 and 129.26) achieved significantly higher ($F = 3.99$, $p < .05$) scores than did pupils who had experienced indirect teaching in the fourth grade (Groups Aa and Ba, mean scores of 112.27 and 106.68).

Mean scores and rankings of pupils in the four teaching behavior conditions on all seven of the measures of creativity used in the study are summarized in Table IX on the next page. Examination of this summary allows the following conclusions to be more easily understood.

The results of this study strongly suggest that the verbal creative potentialities of pupils are fostered more under the influence of indirect patterns of teaching behaviors than they are under the influence of direct patterns of teaching behaviors. Results regarding the figural measures were not as clear-cut as they were for the verbal measures but they do suggest that the figural creative potentialities of pupils are fostered more under the influence of consistent patterns of teaching behaviors (indirect-indirect and direct-direct) than they are under the influence of inconsistent patterns of teaching behaviors (indirect-direct and direct-indirect).

Interpretation of these conclusions, in terms of the Rogers-Flanders conceptual model, at first, appears to be difficult because the results in the verbal and the figural measures were quite different. However, certain explanations do seem tenable.

TABLE IX

MEAN SCORES AND RANKINGS OF PUPILS IN FOUR TEACHING BEHAVIOR CONDITIONS ON ALL MEASURES OF CREATIVITY

Measure of Creativity	Teaching Behavior Condition							
	Aa		Ab		Ba		Bb	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Verbal Fluency*	52.40	1	50.09	2	38.06	4	46.86	3
Verbal Flexibility*	28.22	1	25.98	2	21.75	4	23.44	3
Verbal Originality*	22.18	1	19.13	2	16.64	3	15.68	4
Figural Fluency	18.56	1	16.09	4	17.57	3	18.51	2
Figural Flexibility	14.42	1	12.16	4	13.60	3	13.82	2
Figural Originality	11.60	2	11.07	4	11.42	3	12.68	1
Figural Elaboration*	112.27	3	113.11	2	106.68	4	121.18	1

*Statistically significant differences.

There appear to be two, quite different forms of creative expression, verbal and figural, each providing a means through which a pupil may develop his creative potential. In addition, it seems reasonable to suggest that, within the classroom situation, verbal expressions are more easily and more often controlled than are figural expressions of creativity. It follows that indirect teaching behaviors facilitate both verbal and figural expressions of the pupil's creative potential because both of these means of expression are kept open by the teacher who encourages their use. On the other hand, it seems that direct teaching (and then only when it is consistent from year to year) permits only figural expressions of the pupil's creative potential because this is the only outlet open since verbal expressions are generally controlled by the teacher's direct behaviors.

It would seem, then, that if teachers value, as one of their instructional goals, the fostering of the creative potentialities of pupils, then it becomes their responsibility to influence their pupils through a consistent use of indirect teaching behaviors beginning with the earliest schooling experiences of those pupils.

REFERENCES

Amidon, Edmund, and Ned Flanders. The Role of the Teacher in the Classroom: A Manual for Understanding and Improving Teachers' Classroom Behavior. Minneapolis, Minnesota: Paul S. Amidon and Associates, 1963.

Flanders, Ned. Teacher Influence, Pupil Attitudes, and Achievement. United States Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 397. Minneapolis: University of Minnesota, 1960.

Rogers, Carl. "Toward a Theory of Creativity," Etc: A Review of General Semantics, 11:249-60, Summer, 1954.

Torrance, E. Paul. Torrance Tests of Creative Thinking, Research Edition, Verbal and Figural Tests, Form B. Princeton, New Jersey: Personnel Press, Inc., 1966.